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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,706

12/29/2006

Runo Nielsen

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25570

7590

12/05/2008

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EXAMINER

BEHM, HARRY RAYMOND

ART UNIT

PAPER NUMBER

2838

NOTIFICATION DATE

DELIVERY MODE

12/05/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/595,706	<b>Applicant(s)</b> NIELSEN ET AL.	
	<b>Examiner</b> HARRY BEHM	<b>Art Unit</b> 2838	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5 is/are rejected.
- 7) ☒ Claim(s) 3-4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/5/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 5/5/06 was considered by the examiner.

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: “thesecond” on line 13 should be ‘the second’.

Claim 5 is objected to because of the following informalities: Claim 5 lacks a transitional phrase making the claim unclear where the separation of the preamble from the body of the claim occurs. The preamble is interpreted as “Method for power conversion control in serial resonance switch mode power converters”.

Furthermore, “the oscillating circuit”, “the mode”, “the actual charging current” and “the serial resonant capacitor(s)Cp,Cp’ ” lack antecedent basis. Additionally “a second feedback signal” on line 6 was previously recited on line 4.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Scheel (US 6,351,401).

With respect to Claim 5, Scheel discloses a method for power conversion control in serial resonance switch mode power converters (Fig. 1 1) comprising operating in frequency mode (Fig. 6 low  $U_c$  corresponds to light load) at normal operation where a first feedback signal (Fig. 1  $U_{out}$ ), from the output, is converted to an input to switching means (Fig. 1 3-6), wherein a second feed back signal (Fig. 1  $U_c$ ) is used to influence the charging and discharging of at least one capacitor (Fig. 1 C) connected to the oscillating circuit (Fig. 1 C,L,primary,R), where by increasing load (Fig. 6 increasing  $U_c$  corresponds to increasing load), the mode of operation is changed into a charge mode control by the second feedback signal (Fig. 1  $U_c$ ), which second feedback signal is based on the actual charging current (Fig. 1  $U_c$  is the time integral of  $i_{res}$ ) and thereby change in charge in each half period (Fig. 3  $U_c$ ) of switching on the serial resonant capacitor (Fig. 1 C).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheel (US 6,351,401) in view of Rendl (US 5,680,034).

With respect to Claim 1, Scheel discloses an apparatus for converting power from a power input (Fig. 1 Uz) to an output power supply (Fig. 1 Uout), which apparatus comprises a resonance converter (Fig. 1 1) containing at least two serial coupled semiconductor switches (Fig. 1 3,4) having at least one common output terminal connected to the resonant circuit (Fig. 1 L,C,Primary) and a second coil (Fig. 1 9 secondary coil) connected to rectifier means (Fig. 1 10), which rectifier means has its output connected to output terminals, where a first feedback circuit (Fig. 1 Uout) is connected from the output terminal to an error amplifier (Fig. 4 41), which error amplifier is connected to an input (Fig. 4 Usoll) at a control circuit, which comprises output that is connected over driver means to the input (Fig. 1 a,b) of the semiconductor switches, where the apparatus farther comprises a second feedback circuit (Fig. 1 12) where the second feedback circuit is leading a signal (Fig. 1 Uc) from at least one capacitor(s) Cp (Fig. 1 C), which capacitor is connected in serial to the first coil (Fig. 1 L) to an input terminal, which second feedback circuit comprises a signal (Fig. 1 Uc) depending on the actual change of the charge over the serial resonance capacitor (Fig. 1 integral current

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ires) in each half period of switching (Fig. 3 U<sub>c</sub>), which linearizes (Fig. 6 kC,a) the influence of the first feedback circuit (Fig. 4 U<sub>out</sub>).

Scheel does not disclose the detector of the resonant capacitor voltage connected to the resonant capacitor and does not disclose a second capacitor controlling the switching frequency. Redl teaches a switching resonant converter (Fig. 7) with a first coil (Fig. 7 130) in series with a resonant capacitor (Fig. 7 120) wherein a second feedback circuit (Fig. 7 320,455,450) is connected from the resonant capacitor (Fig. 7 120) to the input terminal (Fig. 7 320 noninverting input) of the control circuit, which input terminal is connected to at least one capacitor (Fig. 7 260) which capacitor is controlling the switching frequency (Fig. 8B Q). It would have been obvious to one of ordinary skill in the art at the time of the invention to implement detection of the voltage of the resonant capacitor with a second feedback circuit to adjust the voltage of a timing capacitor controlling the switching frequency.

The reason for doing so is "to provide a controller for resonant converters that does not require individual adjustment of the timing parameters. It is a further object of the present invention to provide a controller for resonant converters that is able to maintain regulation of the output voltage over a wide range of operating conditions and component tolerances. It is a further object of the present invention to provide a controller for resonant converters that includes additional protection against overload, against overdissipation of the power switch in case of loss of zero-voltage switching, and against overvoltage across the switching device or across the load.", (Redl column 4, lines 41-53).

With respect to Claim 2, Scheel in view of Redl disclose an apparatus according to claim 1, wherein the second feedback circuit is connected from the serial resonance capacitor  $C_p$  (Fig. 7 120) to at least one capacitor (Fig. 7 260) where at least one further capacitor (Fig. 7 180) is connected to a common ground (Fig. 7 GND symbol).

***Allowable Subject Matter***

Claims 3-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if the claim objections stated above are overcome.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein a second feedback circuit where the second feedback circuit is leading a signal from. at least one capacitor(s)  $C_p$ , which capacitor is connected in serial to the first coil to an input terminal, wherein the second feedback circuit is connected to the input terminal of the control circuit, which input terminal is connected to at least one capacitor, which capacitor is controlling the switching frequency, which second feedback circuit comprises a signal depending on the actual change of the charge over the serial resonance capacitor  $C_p$  in each half period of switching, which linearizes the influence of the first feedback circuit, wherein the second feedback circuit contains an inverting amplifier, which output is connected to the input terminal through at least one capacitor.

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The aforementioned limitations in combination with all remaining limitations of the respective claims are believed to render the aforementioned indicated claim and any dependent claims thereof patentable over the art of record.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARRY BEHM whose telephone number is (571)272-8929. The examiner can normally be reached on 7:00 am - 3:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm E. Ullah can be reached on (571) 272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry Behm/  
Examiner, Art Unit 2838